Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2722318 **Date: 02/06/2016**

Subject Name: Database Management Systems

Time:10:30 am to 01:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** (i) Explain difference between weak and strong entity set. **02**

(ii) Explain major functions of DBA **05**

(b) (i) Design a generalizationï specialization hierarchy for a motor-vehicle sales company, which sells motorcycles, passenger cars, vans, and buses. **04**

(ii) Explain the distinction between disjoint and overlapping constraints. **03**

Q.2 **(a)** Consider following schema and give expression in relational algebra and write SQL query for the given statements.

- employee (<u>person-name</u>, street, city)
- works (<u>person-name</u>, company-name, salary)
- company (<u>company-name</u>, city)
- manages (<u>person-name</u>, manager-name)

(1) Find the name of all employees who work for ñKey Bankò **02**

(2) Find the names and cities of residence of all employees who work for ñKey Bankò. **02**

(3) Find the names, company and cities of residence of all employees whose city and company city are same. **03**

(b) Consider the following relation schema and set of FDôs F. **07**

R = { A, B, C, D, E}

A → BC CD → E B→D E→ A

i) Find out closure of F

ii) Find out canonical cover of F

iii) Find out attribute closure of A. is A a candidate key or not?

OR

(b) What is Functional Dependency? Explain lossless decomposition with suitable example. **07**

Q.3 **(a)** Explain system recovery procedure with check point record concept. **07**

(b) Construct an ER diagram for an insurance company with a set of customers, each of whom owns number of cars, also each can have number of recorded accident associated with it. **07**

OR

Q.3 **(a)** During the execution, a transaction passes through several states. List all possible sequences of states through which a transaction may pass. Explain why each state transition may occur. **07**

(b) Construct an ER diagram considering a database used to record the marks that students get in different exams of different course offerings. **07**

Q.4 **(a)** When we can say a relation is in third normal form (3NF)? Give the comparison of BCNF and 3NF. **07**

(b) What is recoverable schedule? Why is recoverability of schedules desirable? **07**

OR

Q.4	**(a)**	Explain with suitable example left outer join and right outer join.	**06**
	(b)	(i)Explain commit and rollback command.	**04**
		(ii) Explain mandatory access control of database security.	**04**
Q.5	**(a)**	Explain system recovery procedure with check point record concept	**07**
	(b)	(i) Consider the relations r1(A,B,C), r2(C,D,E), andr3(E,F),with primary keys A, C, and E, respectively. Assume that r1 has 1000 tuples, r2 has 1500 tuples, and r3 has 750 tuples. Estimate the size of r1 |X| r2 |X| r3	**03**
		(ii) Explain basic concept of referential integrity with use of update and delete operation.	**04**

OR

Q.5	**(a)**	(i) Explain method of query optimization.	**04**
		(ii) Define: primary key, foreign key, unique key, not null, candidate key and super key.	**03**
	(b)	(i) Explain deadlock detection mechanism.	**04**
		(ii) Under what conditions is it less expensive to avoid deadlock than to allow Deadlocks to occur and then to detect them?	**03**

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